

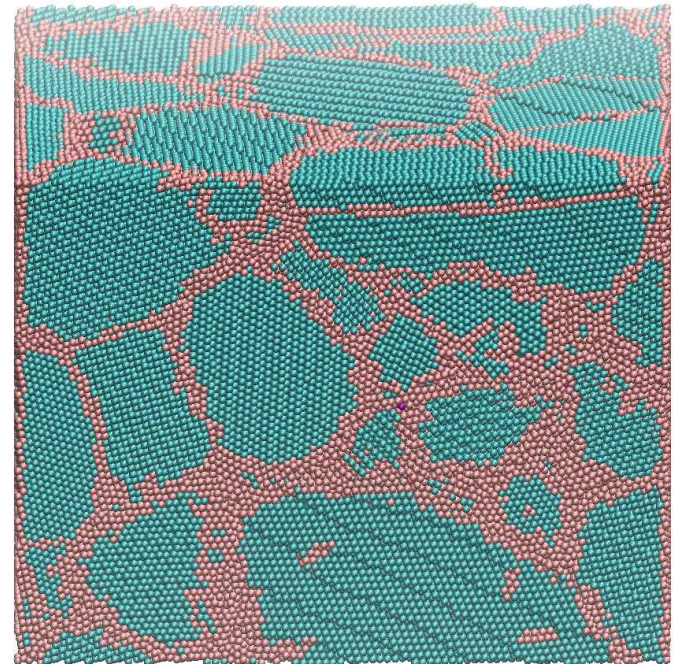
High-pressure ramp wave and shock studies in tantalum and porous media

Tracking# 321450

- We studied dynamic ramp waves using molecular dynamics to understand the effects of strain rate and nanograin structure on material response and strength.
- The project had previously demonstrated scaling of wave profiles across differing strain rates, as well as good agreement with stress-strain response experiments (Davis, et al.) especially at strain below 0.2.
- IMPACT: This effort will support an FY17 milestone in strength of tantalum, which is currently in development.
- The next phase of work will incorporate realistic defect structure into single crystal materials to investigate the effect of dislocation mediated, vs grain boundary mediated plasticity.

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 Code / Platform: LAMMPS / Sequoia
 Usage: 0.01 days

Tantalum polycrystal molecular dynamics



Slice of polycrystalline tantalum target with nanoscale grains modeled atomistically with >2 million atoms.